



PRELIMINARY GUIDE TO THE IDENTIFICATION OF THE EARLY LIFE HISTORY STAGES OF  
CORYPHAENID FISHES OF THE WESTERN CENTRAL ATLANTIC

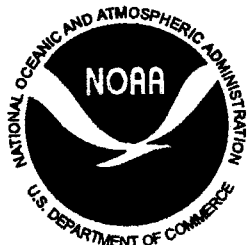
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July 2001



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The dolphinfish family Coryphaenidae contains two cosmopolitan and epipelagic species, common dolphin (*Coryphaena hippurus*) and pompano dolphin (*C. equiselis*). Coryphaenids exhibit sexual dimorphism with mature males characterized by having a prominent bony crest on the front of the head (Palko et al. 1982). The dolphinfishes are elongate and compressed with very long dorsal and anal fin bases and deeply forked tails. Fins lack spines.

Highly prized and widely distributed game fish of both recreational and commercial importance, dolphinfish are found primarily in tropical and subtropical waters of the world (Briggs 1960) though *C. hippurus* also occurs in the Mediterranean Sea (Alemany and Massuti 1998). Two populations of common dolphinfish have been tentatively identified in the western Atlantic, a southern Caribbean and a northern Atlantic Ocean population, each with different life history parameters (Bentivoglio 1989). Dolphinfish grow rapidly but are short-lived (Beardsley 1967). Dolphinfish often associate with floating or drifting objects and are an important member of the *Sargassum* community. Both species spawn from spring through late fall in the northern Gulf of Mexico and possibly year-round in tropical Atlantic (Gibbs and Collette 1959) and southern Gulf waters where water temperatures remain above 24°C.

Lack of pigment along the caudal peduncle and over the caudal finfold separates common dolphin from pompano dolphin <4.5-mm SL. Morphometrics are generally greater in pompano dolphin than in common dolphin with pompano dolphin possessing both a deeper-body and larger eye by 9-mm. Pompano dolphin also has a larger mouth and longer preanal length by 13-mm. Common dolphin possess four spines along the outer margin of the preopercular shelf while pompano dolphin has five, although these spines are often difficult to count on larvae not cleared and stained. Pigmented pelvic fins and bands of pigment laterally on both the body and median fins of common dolphin are diagnostic for separating species >8-mm (Ditty et al. 1994).

Information on larval morphology of pompano dolphin corroborates Johnson's hypothesis of a relationship between Coryphaenidae and Rachycentridae (Johnson 1984) rather than that previously hypothesized between Rachycentridae and Echeineidae. Larvae of dolphinfishes and cobia share similar patterns of head and preopercular spination. Dolphinfishes lack the supracleithral spine found in cobia but possess a small spine on the maxillary that cobia lack. Dolphinfishes also differ from cobia by lacking dorsal and anal spines and having more vertebrae and soft dorsal rays. Echeineids lack head spines and have large hooked teeth anteriorly on the lower jaw (Ditty et al. 1994).

## CORYPHAENIDAE

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### MERISTICS

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#### Vertebrae

|           |       |
|-----------|-------|
| Precaudal | 13-14 |
| Caudal    | 19-20 |
| Total     | 33-34 |

#### Number of fin spines and rays

|                    |            |
|--------------------|------------|
| Dorsal (no spines) | 55 (52-59) |
| Anal               | 26 (23-29) |
| Pectoral           | 18-21      |
| Pelvic             | I, 5       |
| Caudal             |            |
| Dorsal Secondary   | 10-13      |
| Principal          | 9+8        |
| Ventral Secondary  | 10-14      |
| Total              | 41 (37-44) |

#### Gillrakers on first arch

|       |             |
|-------|-------------|
| Upper | 1-2         |
| Lower | 9-10 (8-11) |
| Total | 9-13        |

(reduce in number with growth)

|                 |   |
|-----------------|---|
| Branchiostegals | 7 |
|-----------------|---|

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### LIFE HISTORY

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Range: throughout area

Habitat: epipelagic, shelf and oceanic

ELH pattern: oviparous, pelagic eggs and larvae

#### Spawning

Season: probably year-round at  
water temps >21°C

Area: oceanic waters

Mode: serial spawner

Migration: north-south

Age at first maturity: 3-4 months

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Literature: Gibbs and Collette 1959; Collette  
et al. 1969; Potthoff 1971; 1980; Hagood  
& Rothwell 1979; Johnson 1984;  
Ditty et al. 1994

## *Coryphaena equiselis* (Linnaeus, 1758)

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### EARLY LIFE HISTORY DESCRIPTION

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#### EGGS:

Diameter: mean: 1.35 mm

No. of Oil Globules:

Oil Globule Diameter:

Yolk:

Shell:

Hatch Size:

Incubation: 38 hrs at 26°C

Pigment: oil globule and embryo

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#### LARVAE:

Length at flexion: 7.5-9.0 mm SL

Length at transformation: 25-30 mm SL

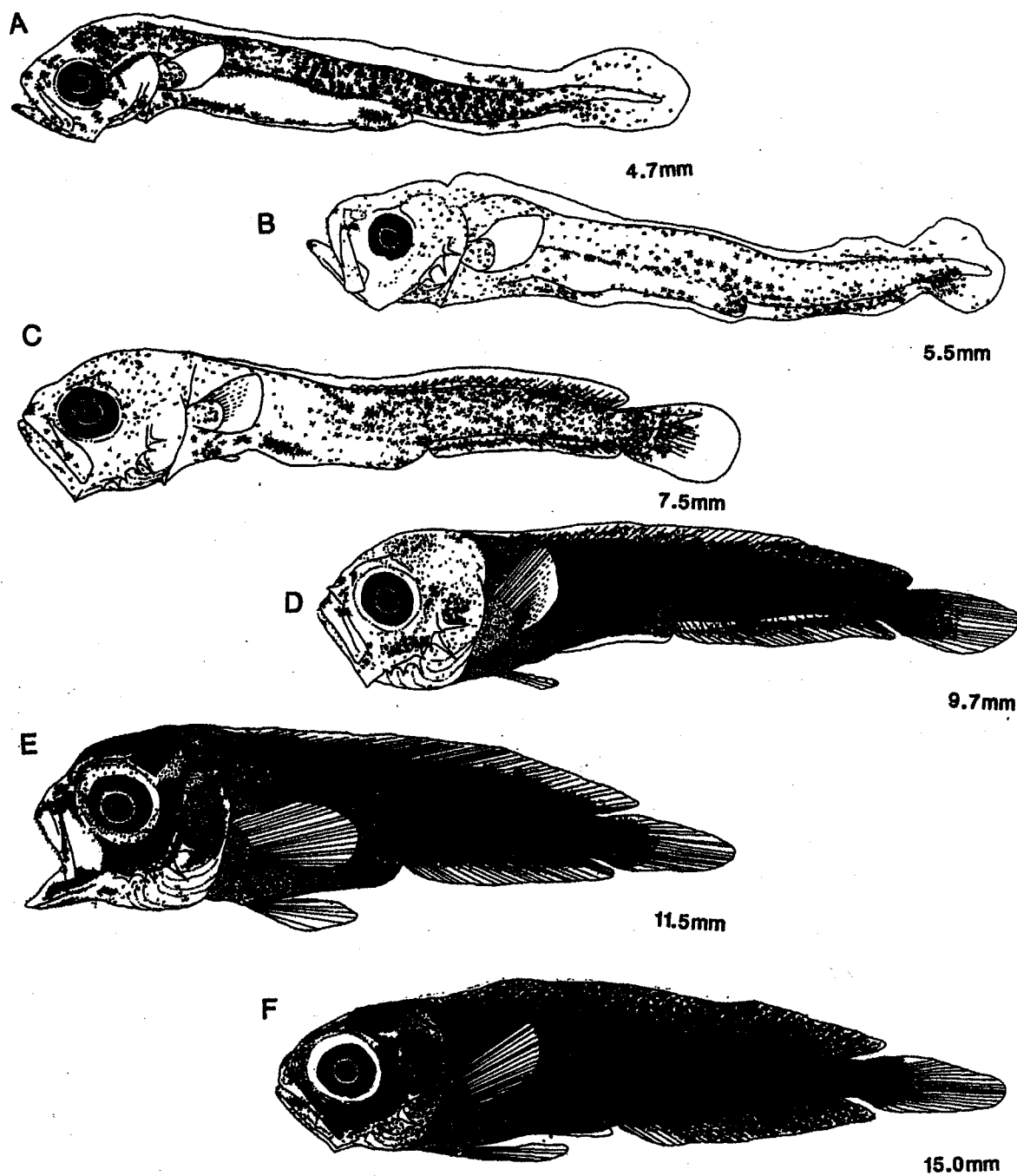
Sequence of fin development: C, A, D, P<sub>2</sub>, P<sub>1</sub>

Pigment: heavy

Diagnostic: from *C. hippurus* <4.5 mm SL by  
pigment in caudal finfold and number of spines  
along outer shelf of preopercle; >8 mm SL  
by lack of pigment on pelvic fins and  
absence of lateral bands; from *Rachycentron*  
by number of soft dorsal rays

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ILLUSTRATIONS: After Ditty et al. 1994. A: 4.7  
mm NL, B: 5.5 mm NL, C: 7.5 mm SL, D: 9.7  
mm SL, E: 11.5 mm SL, F: 15.0 mm SL.



## CORYPHAENIDAE

### MERISTICS

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|                                |            |
|--------------------------------|------------|
| Vertebrae                      |            |
| Precaudal                      | 13-14      |
| Caudal                         | 17-18      |
| Total                          | 30-31      |
| Number of fin spines and rays  |            |
| Dorsal (no spines)             | 61 (58-66) |
| Anal                           | 28 (25-31) |
| Pectoral                       | 18-21      |
| Pelvic                         | I, 5       |
| Caudal                         |            |
| Dorsal Secondary               | 10-14      |
| Principal                      | 9+8        |
| Ventral Secondary              | 11-14      |
| Total                          | 41 (37-45) |
| Gillrakers on first arch       |            |
| Upper                          | 0-2        |
| Lower                          | 7-10       |
| Total                          | 8-12       |
| (reduce in number with growth) |            |
| Branchiostegals                | 7          |

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### LIFE HISTORY

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Range: throughout area  
Habitat: epipelagic, shelf and oceanic  
ELH pattern: oviparous, pelagic eggs and larvae  
Spawning  
  Season: probably year-round at water temps >21°C  
  Area: oceanic waters  
  Mode: serial spawner  
  Migration: north-south  
Age at first maturity: 3-4 months in Gulf of Mexico, 6-7 months in N. E. Atlantic  
Longevity: 4 years but usually <2 years

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Literature: Gibbs and Collette 1959; Collette et al. 1969; Hassler & Rainville 1975; Potthoff 1980; Hagood & Rothwell 1979; Bentivoglio 1989; Ditty et al. 1994

## *Coryphaena hippurus* (Linnaeus, 1758)

### EARLY LIFE HISTORY DESCRIPTION

#### EGGS:

Diameter: mean: 1.3 mm  
No. of Oil Globules: one  
Oil Globule Diameter: 0.3-0.4 mm  
Yolk: segmented  
Shell: Smooth, clear  
Hatch Size: 3.0 mm TL  
Incubation: 38 hrs at 25°C; 26 hrs at 30°C  
Pigment: oil globule and embryo

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#### LARVAE:

Length at flexion: 7.5-9.0 mm SL  
Length at transformation: 25-30 mm SL  
Sequence of fin development: C, A, D, P<sub>2</sub>, P<sub>1</sub>,  
Pigment: heavy  
Diagnostic: from *C. equiselis* <4.5 mm SL by lack of pigment along peduncle and in caudal finfold and number of spines along outer shelf of preopercle; >8 mm SL by pigment on pelvic fins and presence of lateral bands; from *Rachycentron* by number of soft dorsal rays

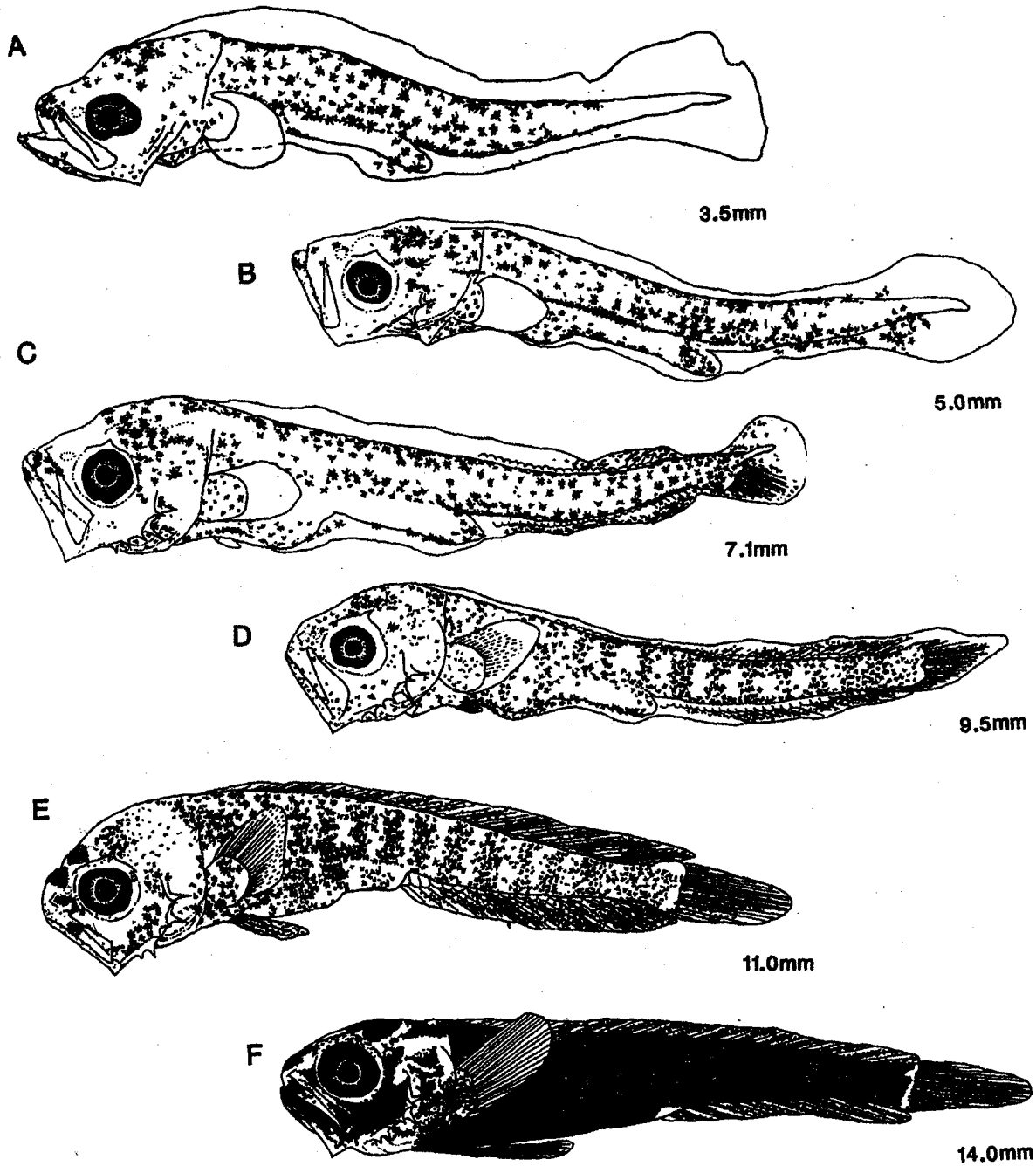
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#### Illustrations: Ditty et al. 1994

A: 3.5 mm NL, B: 5.0 mm NL, C: 7.1 mm SL, D: 9.5 mm SL, E: 11.0 mm SL, F: 14.0 mm SL.

*Coryphaena hippurus*

CORYPHAENIDAE





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